

unique HARQ identification, a data allocation having a predetermined timing offset with respect to the resource allocation, and a hybrid automatic repeat request HARQ acknowledgement allocation having a predetermined timing offset with respect to the data allocation, wherein the timing offset of the hybrid automatic repeat request HARQ acknowledgement with respect to the data allocation is determined in terms of time division duplexing TDD frames and independently of a forward link-reverse link ratio.

[0077] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to define a link-independent hybrid automatic repeat request HARQ entity for one hop by combining two hybrid automatic repeat request HARQ entities, one of the entities representing forward link HARQ and the other reverse link HARQ.

[0078] According to yet another exemplary embodiment, that at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to build a FDD-like hybrid automatic repeat request HARQ on top of a flexible time division duplexing TDD configuration.

[0079] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to define a hybrid automatic repeat request HARQ process such that a forward link HARQ process and a reverse link HARQ process are included asynchronously in each frame.

[0080] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to build a hybrid automatic repeat request HARQ entity such that a forward link HARQ control signal and a reverse link HARQ control signal as well as a forward link data signal and a reverse link data signal are included in a single time division duplexing TDD frame.

[0081] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to define a link-independent hybrid automatic repeat request HARQ entity for multiple hops by chaining HARQ entities such that each hop has one or more HARQ loops of its own running, where each node has a capability to transmit control signalling needed to support HARQ via involved links.

[0082] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to define a maximum number of available HARQ processes based on signalling and implementation constraints.

[0083] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to set the timing offset of the hybrid automatic repeat request HARQ acknowledgement with respect to the data allocation in a different manner for uplink and downlink.

[0084] According to yet another exemplary embodiment, the at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus to allocate one or more HARQ processes in a single frame.

[0085] According to yet another exemplary embodiment, there is provided a user terminal comprising at least one

processor; and at least one memory including a computer program code, wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the user terminal to receive and provide feedback related to a link-independent hybrid automatic repeat request HARQ entity defined for one link direction, wherein the entity comprises a resource allocation for one or more of forward link and reverse link data, the resource allocation comprising at least one hybrid automatic repeat request HARQ process having a process identification, each hybrid automatic repeat request HARQ process having a unique HARQ identification, a data allocation having a predetermined timing offset with respect to the resource allocation, and a hybrid automatic repeat request HARQ acknowledgement allocation having a predetermined timing offset with respect to the data allocation, wherein the timing offset of the hybrid automatic repeat request HARQ acknowledgement with respect to the data allocation is determined in terms of time division duplexing TDD frames and independently of a forward link-reverse link ratio.

[0086] According to yet another exemplary embodiment, there is provided a computer program product comprising program code means adapted to perform any one of the method steps when the program is run on a computer.

[0087] It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims.

LIST OF ABBREVIATIONS

[0088]	ACK acknowledgement
[0089]	ARQ automatic repeat request
[0090]	CP cyclic prefix
[0091]	DL downlink
[0092]	eNB enhanced node-B
[0093]	FDD frequency division duplexing
[0094]	HARQ hybrid ARQ
[0095]	LTE long term evolution
[0096]	LTE-A LTE-advanced
[0097]	NACK negative acknowledgement
[0098]	PHICH physical HARQ indicator channel
[0099]	PUCCH physical uplink control channel
[0100]	PUSCH physical uplink shared channel
[0101]	TDD time division duplexing
[0102]	UL uplink
[0103]	BLER block error ratio
[0104]	ID identification
[0105]	tx transmitter
[0106]	rx receiver
[0107]	D2D device to device
[0108]	AP2AP access to access point

1. A method, comprising:

defining, in a communications apparatus, a link-independent hybrid automatic repeat request HARQ entity for one link direction, wherein the defined entity comprises a resource allocation for one or more of forward link and reverse link data, the resource allocation comprising at least one hybrid automatic repeat request HARQ process having a process identification, each hybrid automatic repeat request HARQ process having a unique HARQ identification, a data allocation having a predetermined timing offset with respect to the resource allocation, and